

Puget Sound Steelhead Recovery Team  
April 28, 2015 Meeting Summary

Decisions and Actions from Meeting

Decision	Notes
Accepted the March 31, 2015 meeting summary as final with edits.	

  

Action	Assignment
1. Update Comparison of Modeling Approaches table to include discussion from this meeting.	Tristan Peter-Contesse, Claire Chase
2. Share SHIRAZ user's manual with Team.	Ed Connor
3. Create a decision tree for watersheds to determine approach(es) to use (for August meeting).	Neala Kendall
4. Compile list of what model(s) watersheds use and when they last used them (for August meeting).	Tristan Peter-Contesse
5. Convene an ad-hoc subgroup to discuss the habitat protection plan.	Scott Powell
6. Share draft <i>RITT Common Framework</i> section of the Recovery Plan outline for Team members to review.	Claire Chase
7. Prepare the Recovery Team workplan to see if there are any lapses in progress; prepare for upcoming Recovery Team meeting.	Elizabeth Babcock, Bob Wheeler, Claire Chase
8. Check meeting space and hotel room availability for August work session and field tour, send "save the date" as soon as possible.	Elizabeth Babcock, Claire Chase

**Welcome, Announcements, & Old Business** – Bob Wheeler, facilitator of the Puget Sound Steelhead Recovery Team ("Recovery Team" or "Team"), welcomed participants and led introductions (*please see end for a list of participants*). There were no changes to the draft agenda. A few Team members suggested edits to the March 31, 2015 draft meeting summary, which were incorporated and the draft was accepted as final with those edits. One announcement was made about the Puget Sound steelhead five-year status review: those interested in providing information for the status review should do so by May 7 to Elizabeth Babcock.

**Compare Modeling Approaches** – Working with others between the March 31 meeting and this meeting, Tristan Peter-Contesse had greatly expanded the information in the table comparing modeling approaches for watersheds to use in developing their recovery chapters. In preparation for the discussion, Bob reviewed several questions to consider, which were revised throughout the discussion (see page 5 for the final list of questions).

The Team discussed that their task is to identify one or more modeling approaches that can be recommended to watersheds as tools in developing local watershed chapters. They acknowledged that a watershed might come up with their own way to develop their chapter, which would also be acceptable.

The Team may wish to discourage watersheds from using a particular tool, however, which they noted is important to identify for the watersheds.

The table outlined seven models or approaches: EDT, life cycle, RIPPLE, SHIRAZ, watershed assessments, NetMap, and a formal decision theoretic framework. Numerous criteria were included in the table by which to compare each model, which Tristan filled out with as much detail as possible with the help of several experts. The Recovery Team reviewed the information for each model and the discussion included:

- EDT: Some Team members expressed discomfort with the Ecosystem Diagnosis & Treatment (EDT) model. Others asked why this discomfort existed, as they had seen EDT used successfully in some cases.
  - If the Team ends up recommending to watersheds not to use EDT, it will be important to explain why that is.
  - Some Team members who have had unsuccessful experiences with EDT explained some of their hesitation, including:
    - The model focuses on smaller reaches than other models, and it uses the Beverton-Holt stock recruitment model but the developers have not considered using other stock recruitment models.
    - The model uses expert opinion. When inputting data and a parameter or function relationship is unknown, information must still be input (e.g., there can be no blanks).
    - EDT can find confidence intervals but when a sensitivity analysis was done years ago there was discomfort with the point estimate of survival and fish capacity (the end point of the number of fish aimed for). The absolute predictions had less accuracy than desired.
    - EDT is not stochastic.
    - The model is proprietary so being able to tweak the information as the years go on is harder than with other models, and can be costly.
    - The model can only take one set of information, so everyone in the watershed must agree on the data.
    - The data inputs are many and time-consuming, and once complete and the output is available, if a revision is desired it can be hard to know where to revise the data inputs to get a different output.
    - In the Nooksack they did not have as much success with EDT as with other watersheds because their license did not allow them to go into depth with the model. Also, they used EDT for Chinook planning, which rely on big rivers and the Nooksack watershed does not perfectly match that landscape.
  - Some Team members have had successful experiences with EDT, and shared advantages of the model, including:
    - The model is considered “turnkey,” meaning it is ready to go and does not need to be built from scratch like many other models.
    - Working with the EDT consultants was helpful and they can be used as a resource for many questions and re-running the model.

- Many watersheds are familiar with the EDT model as they might have used it or know of an area that has used it. EDT is one of if not the most widely used models in the Northwest.
- EDT is strong at comparing restoration scenarios, which is one of the main tasks for watersheds to do for their steelhead recovery chapters.
- The model integrates different life stages well.
- Even though EDT is costly, if a watershed is willing to pay for a license, they could have the ability to go back to the model and re-run it as often as they desired. For example, Nisqually bought a license and was able to re-run the model about every year or two years.
- While there was concern that EDT would not incorporate more complex situations more common to steelhead than other salmonids, like iteroparity, it seems to have been incorporated satisfactorily in the Nisqually project.
- Life Cycle Model: it was suggested to think of this model as a broad umbrella category that includes RIPPLE and SHIRAZ. The general idea is to link generations of fish together. Discussion of this model included:
  - The modules in EDT do not exist in life cycle models, particularly linking habitat to fish capacity survival.
  - The life cycle model that is being developed for the Distinct Population Segment (DPS) will hopefully include available datasets on habitat.
    - It will also be more coarse (meaning at the population or watershed scale, not individual reaches). A comparison within a watershed could be pursued through the life cycle model but would need data on fish and habitat at the same resolution to properly populate the model.
    - The body of work from the DPS-scale life cycle modeling effort will be available for all the watersheds, but in order to get to site-specific restoration strategies they will likely need other tool(s). The group currently working on the life cycle model will work hard to determine how to make the model as accessible as possible to the watersheds.
- RIPPLE: considered a “turnkey” version of SHIRAZ. Very similar to the outline of the life cycle model, above.
- SHIRAZ: This version of the life cycle model was developed to make EDT more user-friendly. Discussion on SHIRAZ included:
  - This model is not a “turnkey” model, but since it is not proprietary, the user’s manual is easily accessible. Ed Connor offered to share this with the Team.
  - The model is based on standard equation models. It begins with eggs and goes through a survival model, and treats different parts of the life history separately.
  - The model looks at capacity using a multi-stage Beverton-Holt curve, including how many eggs and juvenile fish various areas can support.
  - It is a multi-cohort model meaning that one generation feeds the next, using fecundity and sex ratios.
  - A lot of biology needs to be input to the model, but it is a build-it-yourself model. It requires someone who can code in visual basic and Excel (the formulas and Excel templates are available in the user’s manual).

- Several relationships were developed by a student of the developer, which might be able to be used in other watersheds.
- The Scheuerell et al paper in Snohomish helps illustrate how SHIRAZ was used in comparing different restoration strategies.
- EDT and SHIRAZ were both done recently in the Chehalis basin. The SHIRAZ scenarios were done based on habitat. In order to compare the two models, using this watershed might be a good way to do so even though it is outside the Puget Sound steelhead DPS.
- SHIRAZ can help look at specific decadal survival or marine survival. EDT mainly looks at freshwater, but data can be input for estuaries (as Nisqually did).
- The model is customizable to any scale desired.
- Watershed Assessments: this was explained by Tim Beechie at the January 2015 Recovery Team meeting. Additional points and discussion included:
  - Watershed assessments complement the life cycle model well. They are less of a model and more of a way to collect empirical habitat data needed to understand functional habitat for the species of interest. The assessments measure attributes of the habitat that can be used to estimate parameters for a model.
  - While it complements a model well, it can be a stand-alone product to assess the habitat. A model would be needed to link the habitat to numbers of fish and actions to affect the population.
  - Some watersheds have basically been doing these assessments for the last thirty years.
- NetMap: Tristan was unable to get information on NetMap in time for this meeting, but hopes to get that in time for the next Recovery Team meeting. The Salmon Center in Portland uses NetMap quite a bit on the Washington Coast.
- Formal decision theoretic framework: this was suggested by Jeff Hard for the Team to consider how variables react with one another. Discussion included:
  - This is different than an outright model; the framework lends itself to scenarios analyses. It was used for Oregon Coast coho which can be an example.
  - The framework can be constructed to capture the level of uncertainty. The Technical Recovery Team (TRT) used this because it is flexible, scalable, and transparent. The framework allows qualitative and quantitative information to be together.
  - While it does lend itself to formal sensitivity analysis, it was noted that this framework is more complementary to the other models discussed earlier, as opposed to a replacement.
- The Team discussed that watershed experts often do not have as much data as they think, so encouraging them to only use the data they have might be a tricky conversation down the road.
- Once each model was discussed in detail, the Team considered what additional information was needed in order to make a decision on which model(s) to recommend to the watersheds. Points included:
  - Interest in input from local biologists and co-managers.
  - With the life cycle model being so general, it is hard to know at this point if one modeling approach would be better suited over the others to complement the life cycle model at the watershed level.
  - Watersheds most typically work with EDT or do a version of watershed assessments. There is less familiarity across the board with the other modeling approaches.

- Concern that whatever model is used is only as good as the data going into it. With the lack of data on Puget Sound steelhead, concern was expressed over whether any model can give a confident enough answer. It was noted, though, that having a model for steelhead can help overtime.
- Resources and funding will play a part in the decision by each watershed on what approach(es) they will use to get to site-specific restoration actions.
- Recommendation for the Team to discuss sideboards to give to watersheds (e.g., anything that watersheds are discouraged from using, rather than a recommendation to use a certain approach over others). A potential sideboard is that EDT should not be used when it is being applied to establish productivity, abundance, and capacity goals. EDT could still be used for other ways, however. These sideboard(s) would be incorporated into the watershed guidance.
  - The Team agreed that EDT can be used in a range of ways, and some are satisfactory (like in Nisqually) and some are unsatisfactory (like in Nooksack and Chehalis). So if the Team will allow for EDT to be used at the watershed level, they would like to recommend ways for it to be used like it was in Nisqually so the results are satisfactory.
  - If the Team does not recommend EDT at all, it was suggested that they think what to recommend for Nisqually, which already invested time and money into a robust EDT effort.
- The intent of the watershed guidance is to narrow the diversity of information that the Team needs to incorporate in the larger Recovery Plan for the DPS and Major Population Groups (MPGs). So the intent is to give guidance recommending a suite of tools, but also sideboards for what not to do so it can all be used at the DPS-scale. The guidance should also include how watersheds can complement the work of the life cycle modeling effort.
- Tristan Peter-Contesse agreed to see what the watersheds use or have used, beyond EDT and watershed assessments.

Throughout the discussion, questions to consider for the next discussion on this were expanded and captured here:

1. Any questions, changes, additions to the table? (The discussion captured above will be added to the table for the next Recovery Team meeting.)
2. What are the key factors presented that are important to your recommendation?
  - a. Consider input from watershed/local biologists.
  - b. Precision – linking project justification (habitat-based) to more general strategy and local jurisdictional decision-making.
  - c. Need to provide watersheds with the level of information necessary to identify recovery/restoration strategies.
  - d. Understand the process of lead entities.
  - e. Watersheds are presently using EDT and watershed assessments (because they're habitat-based) – this will be confirmed by Tristan's outreach to watersheds.
  - f. Gap analysis – what's missing from Chinook and what do we need to add for steelhead?
  - g. Impact of cost and capacity for modeling effort(s) – watersheds will need additional resources to implement almost any of the models. Look at level of need from each option.

- h. Complex species (more so than other salmonids)
    - i. What can we do with minimal lift for those watersheds that haven't used anything in the past? What do we suggest watersheds do with very little data?
3. Can any of these be removed from consideration? Why?
  - a. None at this time – desire to see information on NetMap and revisit this question at the next Recovery Team meeting.
4. What additional information is needed to make the recommendation to watersheds?
  - a. Are watersheds using other models beyond EDT and watershed assessments? Compile list of what all watersheds use. What have the watersheds been using for Chinook and Hood Canal summer chum, and if they've done anything for steelhead? And when was the last date of use, and any impressions on those model(s)?
5. What are the pros and cons of any method?
6. What is the degree to which the model(s) complements the life cycle model effort and outcomes?

**Level of Specificity in Recovery Plans** – Elizabeth Babcock noted that the National Marine Fisheries Service (NMFS) has approved a wide range of plans as long as they have the general content that is included in their guidance document for what should be in recovery plans. So far, the Steelhead Recovery Team is on the right track to create a plan that NMFS could approve. Examples shown were the Upper Columbia plan (which is very in-depth) and the Upper Willamette plan (which is leaner and cites other recovery documents by reference), yet both were approved.

- One concern is how to balance having a DPS-scale recovery plan that includes two pilot watersheds' templates, but also encourage each watershed to write their own recovery chapter with site-specific actions. The outreach through the life cycle model workshops in late April and mid-May will help notify watersheds of this effort and to figure out how to follow up with those tasks.
- A contradiction was noted in that the Team is encouraging each watershed to use a model to get to site-specific actions, while National Estuary Program funding rarely focuses on model-based projects. Despite that contradiction, the goal of the Recovery Team is to justify site-specific recommendations to satisfy the NOAA statute.

**Recovery Plan Outline** – The Team reviewed various assignments for the Recovery Plan outline, including:

- Habitat Protection Plan: the Snohomish Basin Protection Plan is nearing completion and could be used as an example in this section. Scott Powell offered to convene an ad-hoc subgroup in May to flesh out what should be in the habitat protection plan and how it should be developed, and bring back a proposal to the Team at the next meeting.
- RITT Common Framework: Ken Currens drafted this section and it will be shared with the Team for any suggested edits.
- Periodicity table: the table has been updated in the draft Recovery Plan outline and a separate document has been created that has the table plus all the Puget Sound references that went into creating it. This is ready to share with local biologists and co-managers, and will be done after the life cycle model workshops when there will be time to talk about details of data in a population-by-population sense.

- Watershed and Management Units: PSP has almost completed an interactive map with multiple GIS layers that will help this discussion. They are missing some data on hatchery and harvest management unit boundaries, and are working with NMFS to get them. It was suggested that PSP contact Andy Wies in case he can help get those layers.
  - The primary product of this conversation will be a map with layers for Chinook boundaries, steelhead populations, harvest and hatchery management units, etc.
  - The map will hopefully help answer the question of scale, and how to align the decision-makers in the most logical sense.
- A section on limiting factors will be addressed by the Pressures & Stresses Workgroup. They hope to capture what is in the literature on pressures, stressors, and stresses, and then put it into Puget Sound terminology, and then use the Puget Sound Pressure Assessment (PSPA) to confirm the information. Even though the PSPA does not include steelhead as an endpoint, it does cover the steelhead ecosystem.
- It was suggested that the Recovery Plan sections be written in a way that they can stay relevant over time, knowing that the Plan will not be final for several years and the Team would like it to be relevant for several years after that.

**Recovery Team Workplan** – The Team reviewed highlights of the Recovery Team workplan.

Discussion included:

- There is a difference in public outreach opportunities between sending documents to the listserv and noticing in the Federal Register. PSP can help send information and documents to the public when appropriate.
- The Team agreed that it is important to stay transparent with those interested in the Team's work, while also not prematurely getting word out to a broad audience before full comments are needed.
- The Team agreed to revisit the idea of public outreach opportunities in Fall 2015 when they know better what level of information and the type of document(s) they would share.

**Workgroup Progress Reports** – each Workgroup shared recent progress:

*Recovery Goals & Scenarios Workgroup*

- The Workgroup is getting ready for the life cycle model workshops (April 30, May 13 & 15). They have 20-25 participants registered for each workshop already.
- Joe Anderson reviewed the slides he prepared for the beginning of each workshop and received some clarifying feedback from the Team.
- A question came up for the Team to consider in the future: are habitat goals needed, in addition to population goals? Will the life cycle model focus on both sets of goals?

*Watershed Template Workgroup*

- The Workgroup is finalizing a portfolio of elements to use as a menu for watershed-scale recovery planning, as well as developing guidance for using the portfolio of elements.
- At an upcoming meeting, the Workgroup plans to share the portfolio of elements with the Team for discussion and feedback.

*Pressures & Stresses Workgroup*

- They have begun to crosswalk stresses, stressors, and pressures from major steelhead documents and identify common/most important stresses, stressors, and pressures.
- This table will ultimately be brought to the Recovery Team, though it still is in the works.

**Summer Field Tour & Work Session** – The Recovery Team discussed dates and topics for the August work session and field tour in the Elwha basin.

- **Dates**: The Team considered August 6 & 7 or 10 & 11. With about as much availability in one set of dates as the other, Elizabeth Babcock and Claire Chase will check meeting space and hotel room availability in case one set of dates has more availability. They will follow up soon with the Team so everyone can mark calendars.
- **Potential Topics**: prepping draft Recovery Plan outline for distribution to listserv in Fall 2015; interim review of life cycle modeling effort; review draft watershed guidance; consider model(s) for watershed guidance; team building; field tour in Elwha basin. Other ideas on topics for the work session should be sent to Elizabeth Babcock and Claire Chase.

The meeting adjourned at 2:30pm.

Participants:

<b>Participant</b>	<b>Affiliation</b>
Joe Anderson	Washington Department of Fish & Wildlife
Elizabeth Babcock	NOAA's National Marine Fisheries Service
Ed Connor	Seattle City Light
Ned Currence (phone)	Nooksack Tribe
Ken Currens	Northwest Indian Fisheries Commission
Jeanette Dorner	Puget Sound Partnership
Jeff Hard	Northwest Fisheries Science Center
Neala Kendall	Washington Department of Fish & Wildlife
Randy McIntosh	NOAA's National Marine Fisheries Service
Susan O'Neil	Long Live the Kings
Tristan Peter-Contesse	Puget Sound Partnership
Scott Powell	Seattle City Light
David Price	Washington Department of Fish & Wildlife
Bob Wheeler	Triangle Associates
Claire Chase	Triangle Associates